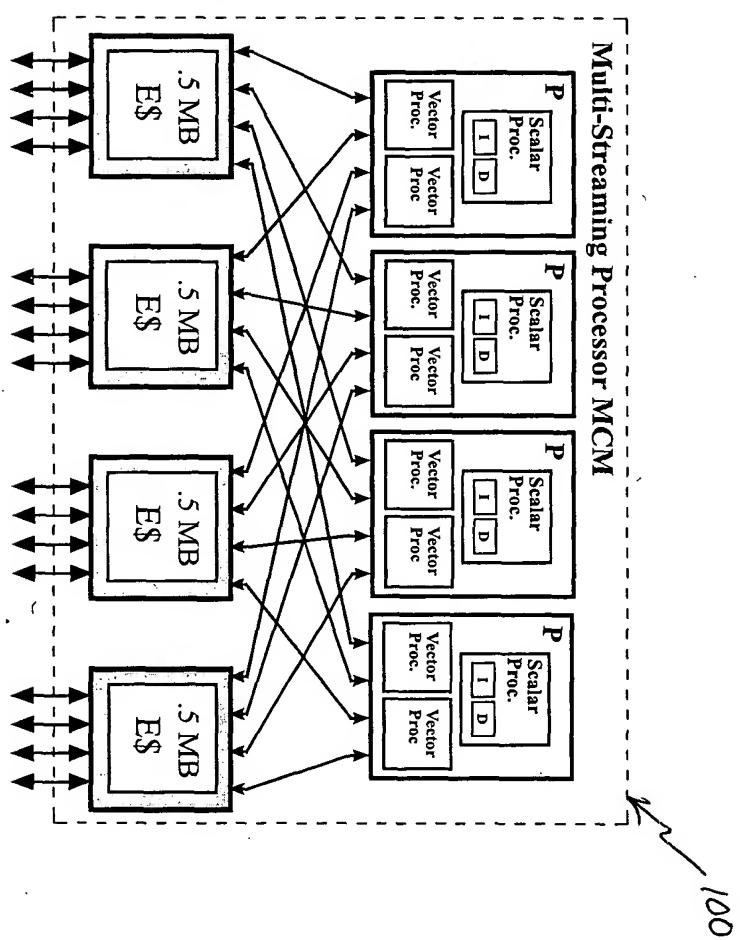


FIG. 1A



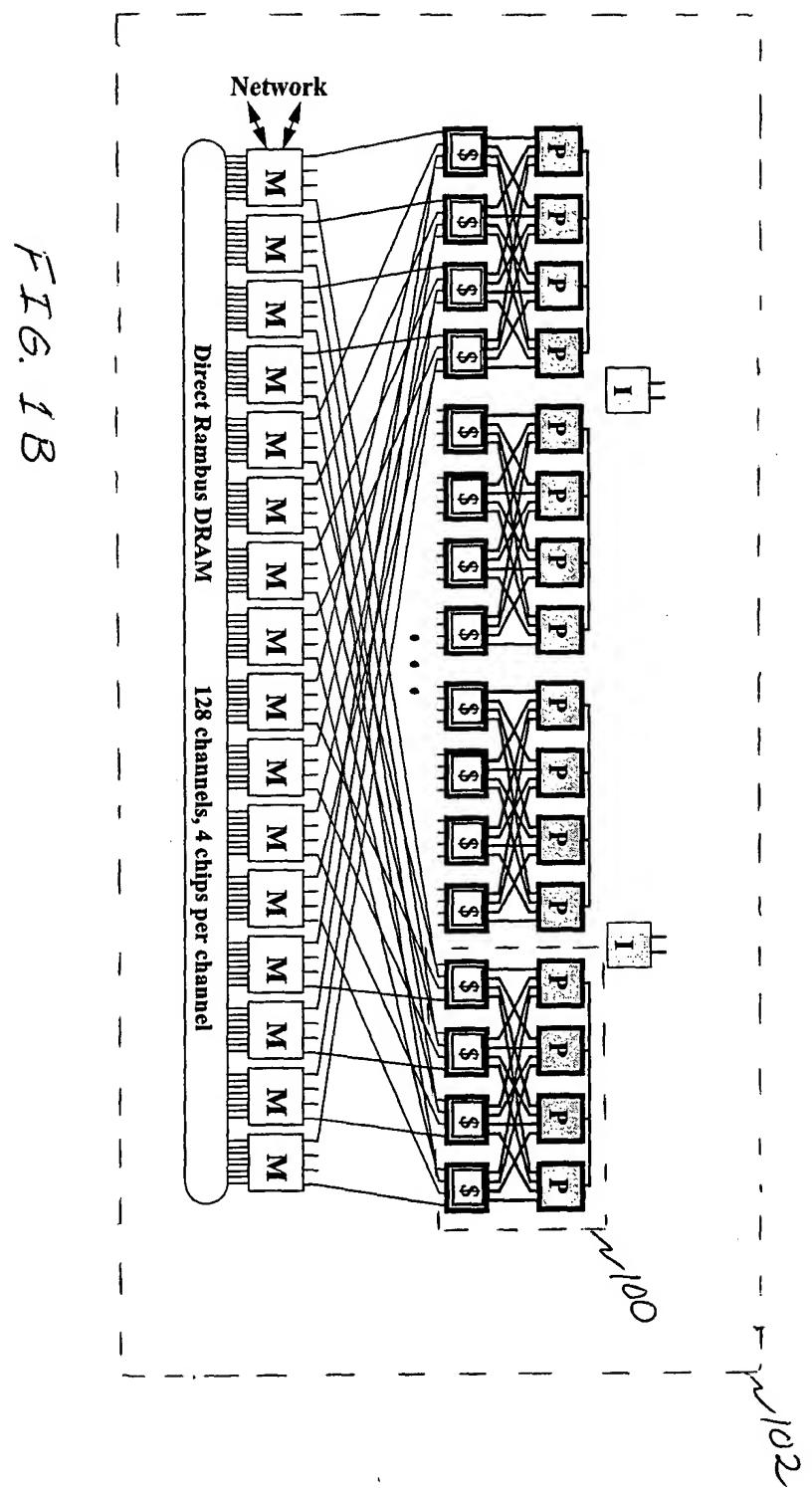


FIG. 1B

Physical address format

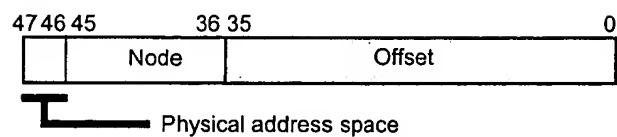


FIG. 2A

Physical Address Map

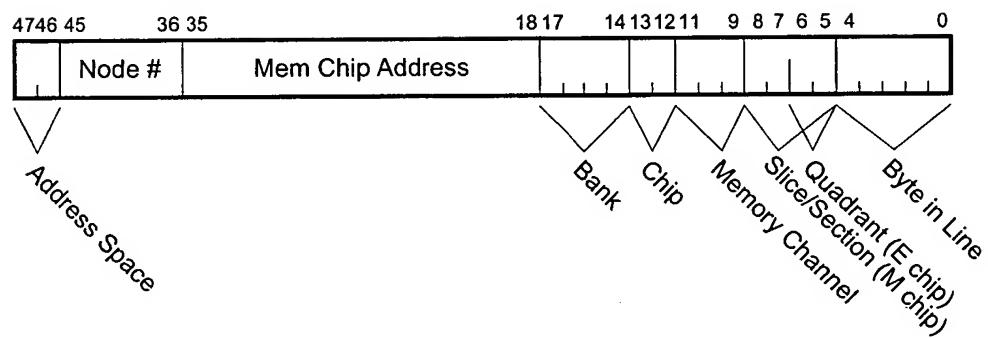


FIG. 2B

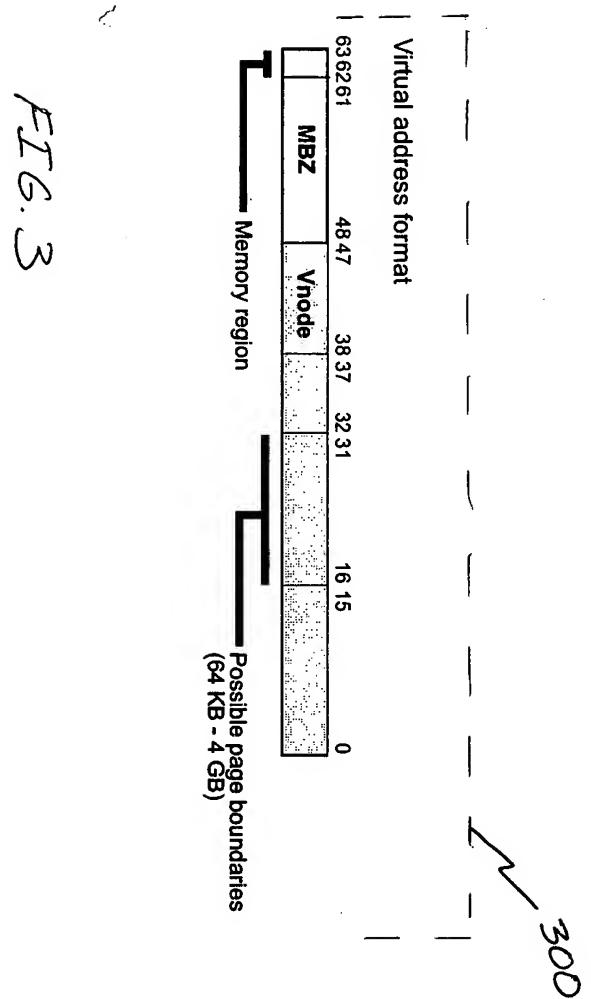


FIG. 3

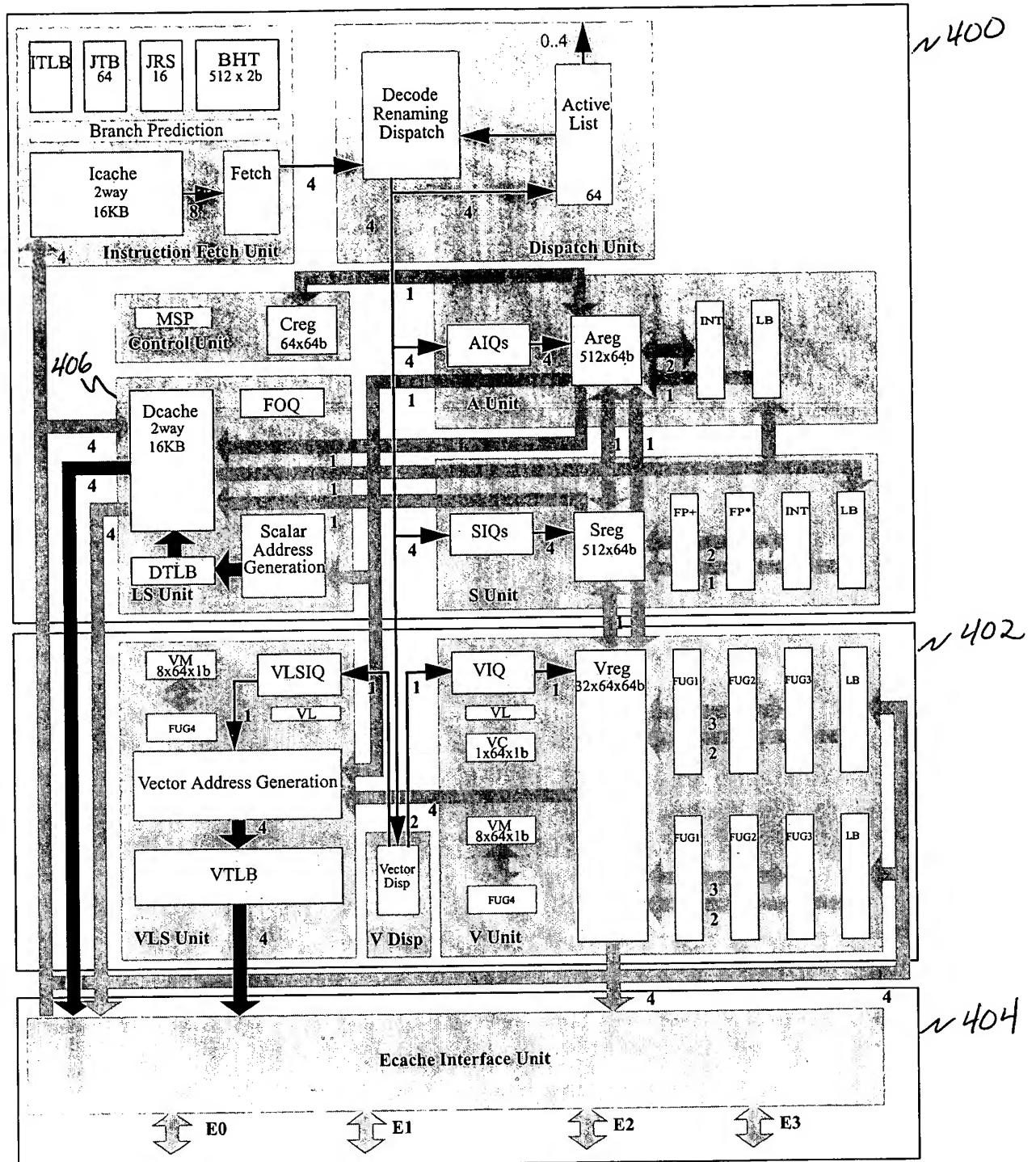


FIG. 4A

FIG. 4B

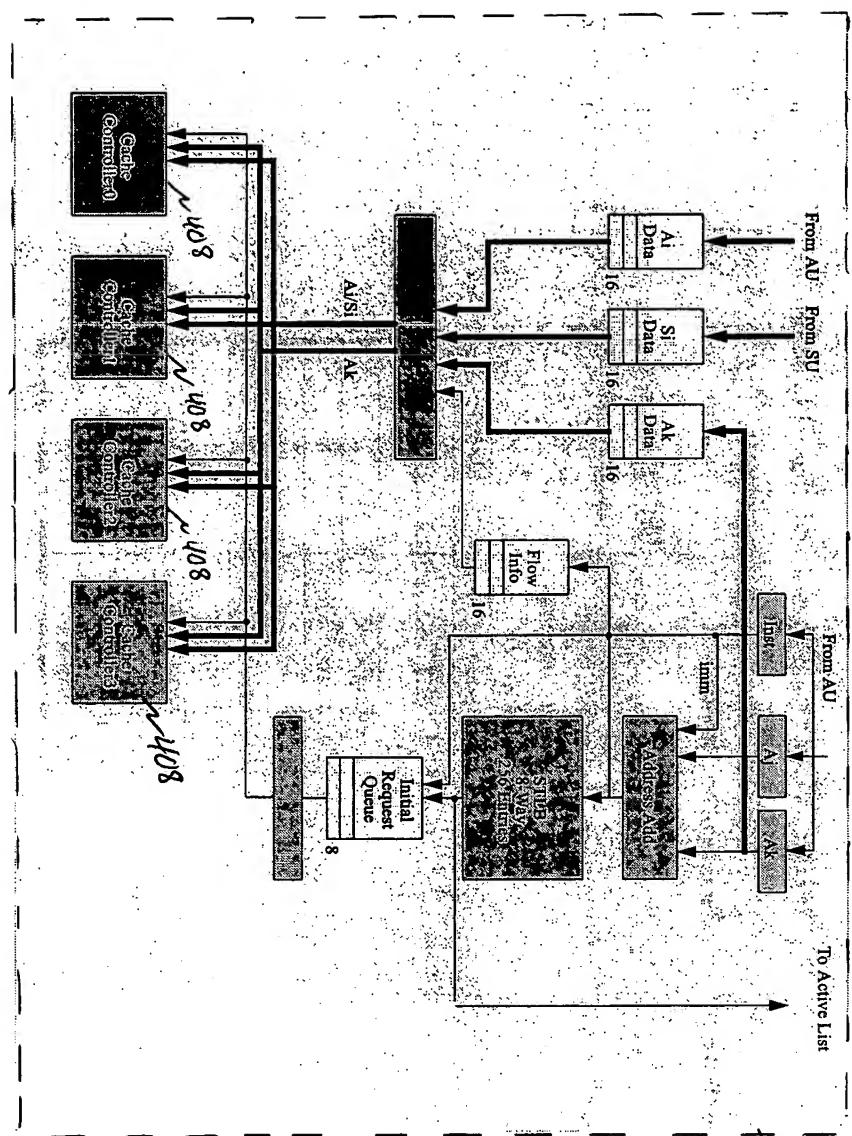
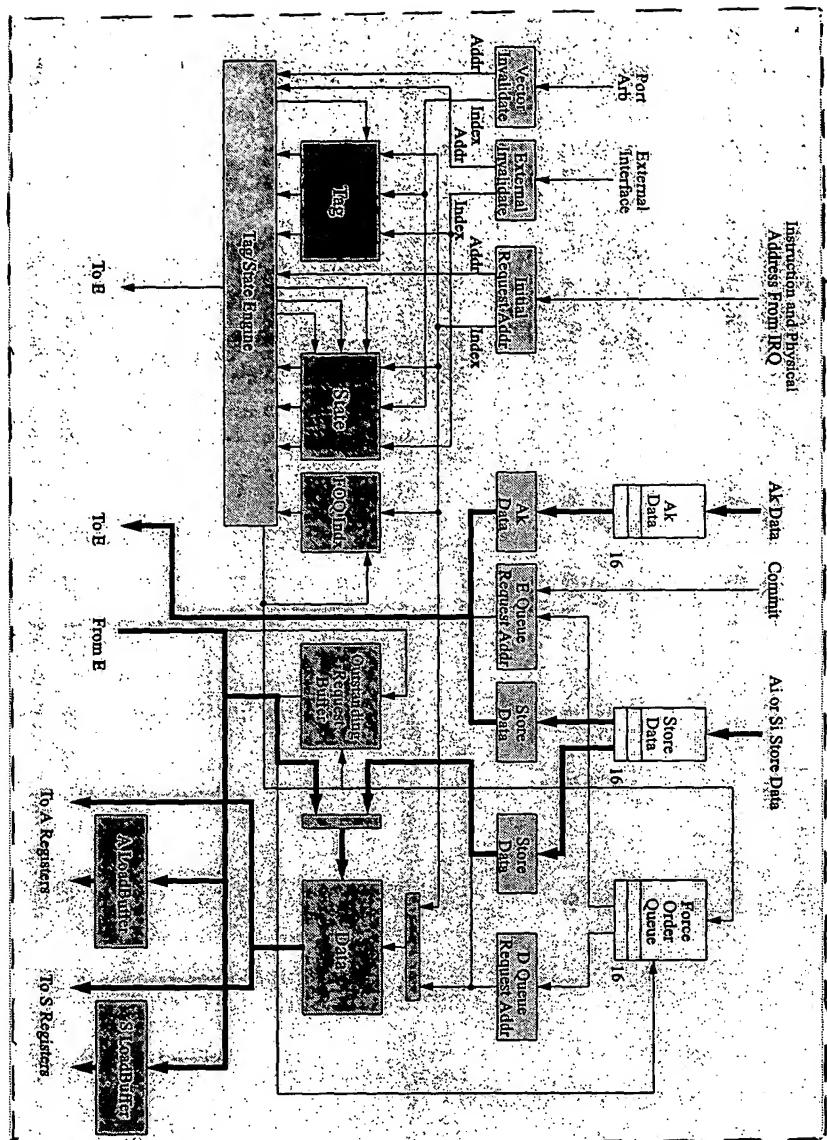


FIG. 4C



✓ 410

Deache Bypass	Initial Request	Tag & State	FOQ Index Match	Action								
				Msg to E	D\$	FOQ entry	E	D	P	Allocate	ORB Entry	Other
No	Read	Miss	No	Read		Dummy		x	x	LRU Way	Read	
			Yes			ReadUC	x				Read nc†	
		Hit	No		Read							
			Yes†			Read		x				
	ReadShared	Miss	No	ReadShared		Dummy		x	x	LRU Way	Read	
			Yes			ReadUC-Shared	x				Read nc	
		Hit	No		Read							
			Yes††			Read		x				
	ReadNA	Miss	No	ReadNA							Read nc	
			Yes			ReadNA	x				Read nc	
		Hit	No		Read							
			Yes			Read		x				
	Write	Miss	No	ReadMod		SWrite	x	x	x	LRU Way	Read	
			Yes			SWrite	x					
		Hit	No			SWrite	x	x				
			Yes									
	WriteNA	Miss	No			SWriteNA	x					
			Yes									
		Hit	No			SWrite	x	x				
			Yes									
	Prefetch (to discard)	Miss	No								Discard	
			Yes									
		Hit	No									
			Yes									

FIG. 4D

2410

Dcache Bypass	Initial Request	Tag & State	FOQ Index	Action									
				Match	Msg to E	D\$	FOQ entry	E	D	P	Allocate	ORB Entry	Other
Yes	Read	Miss	No				ReadUC	x				Read nc	
			Yes										
		Hit	No								Invalidate		
			Yes										
	ReadShared	Miss	No				ReadUC-Shared	x				Read nc	
			Yes										
		Hit	No								Invalidate		
			Yes										
	ReadNA	Miss	No				ReadNA	x				Read nc	
			Yes										
		Hit	No								Invalidate		
			Yes										
Write	Write	Miss	No				SWrite	x					
			Yes										
		Hit	No						x				
			Yes										
	WriteNA	Miss	No				SWriteNA	x					
			Yes										
		Hit	No						x				
			Yes										
	Prefetch (to discard)	Miss	No									Discard	
			Yes										
		Hit	No										
			Yes										
	IORread						ReadNA to IO space	x				Read nc	
	IOWrite						SWriteNA to IO space	x					
	afadd ‡‡						afadd (1 dw)	x				Read nc	
	afax						afax (2 dw)	x				Read nc	
	acsswap						acsswap (2 dw)	x				Read nc	
	aadd						aadd (1 dw)	x					
	aax						aax (2 dw)	x					
	Lsync_s_v						Lsync_s_v	x					
	Lsync_v_s						Lsync_v_s	x				Hold IRQ	
	Msync						Msync	x				Bypass Mode On	
	Msync P Msync V						Msync	x					
	Gsync						Gsync	x					

†A "Read nc" ORB entry specifies that the returning data will not be cached. Both ReadNA and ReadUC requests use "Read nc" ORB entries. (A ReadNA tells the Ecache not to allocate the line. A ReadUC tells the Ecache that the *P chip* will not be caching the line but the Ecache still should.)

‡Do more sophisticated match here (require pending or word match)

‡‡Do more sophisticated match here (require pending or word match)

‡‡These five packet types are AMOs. The FOQ column indicates how many dwords of data accompany the request. Three of the AMOs return data, and two do not.

FIG. 4E